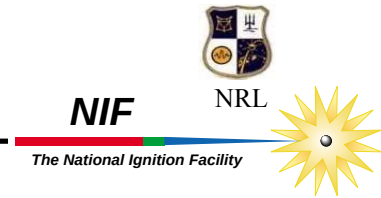
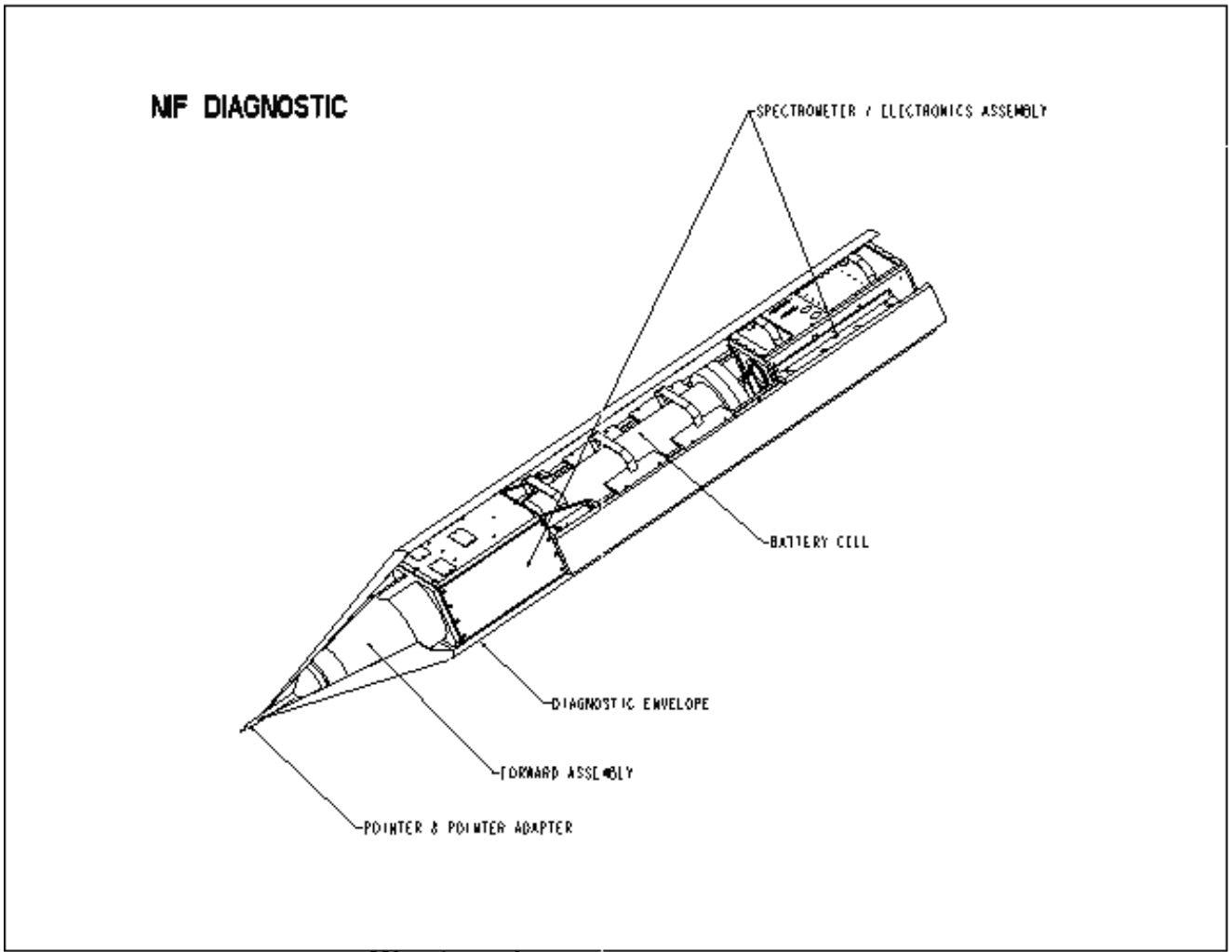
Agenda for the HENEX 65% Design Review



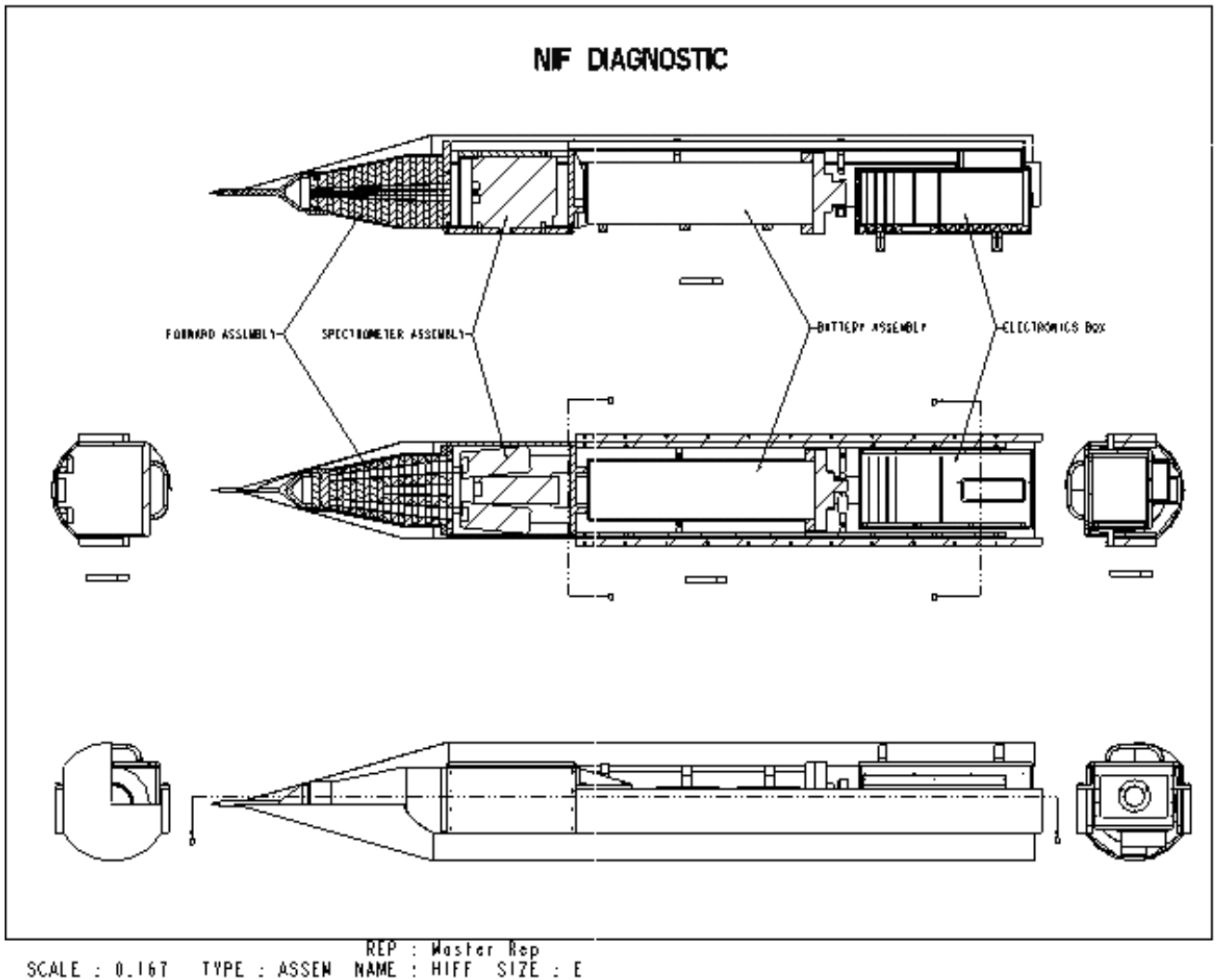
1. Opening (Tina Back, tinaback@llnl.gov)
2. Design Overview (John Seely, john.seely@nrl.navy.mil)
3. Mechanical Design (Layne Marlin, lmarlin@ssd5.nrl.navy.mil)
4. Optical Design (Larry Hudson, larry.hudson@nist.gov)
5. Electronic Design (Rob Atkin,ratkin@tigerinnovations.com)
6. Interface/Sensor (Glenn Holland, gholland@ssd5.nrl.navy.mil)
7. Project Schedule (Perry Bell, e061547@popeye.llnl.gov)

Questions/comments: Please refer to presentation number 3.

HENEX overview



Cutaway views



Nosecone

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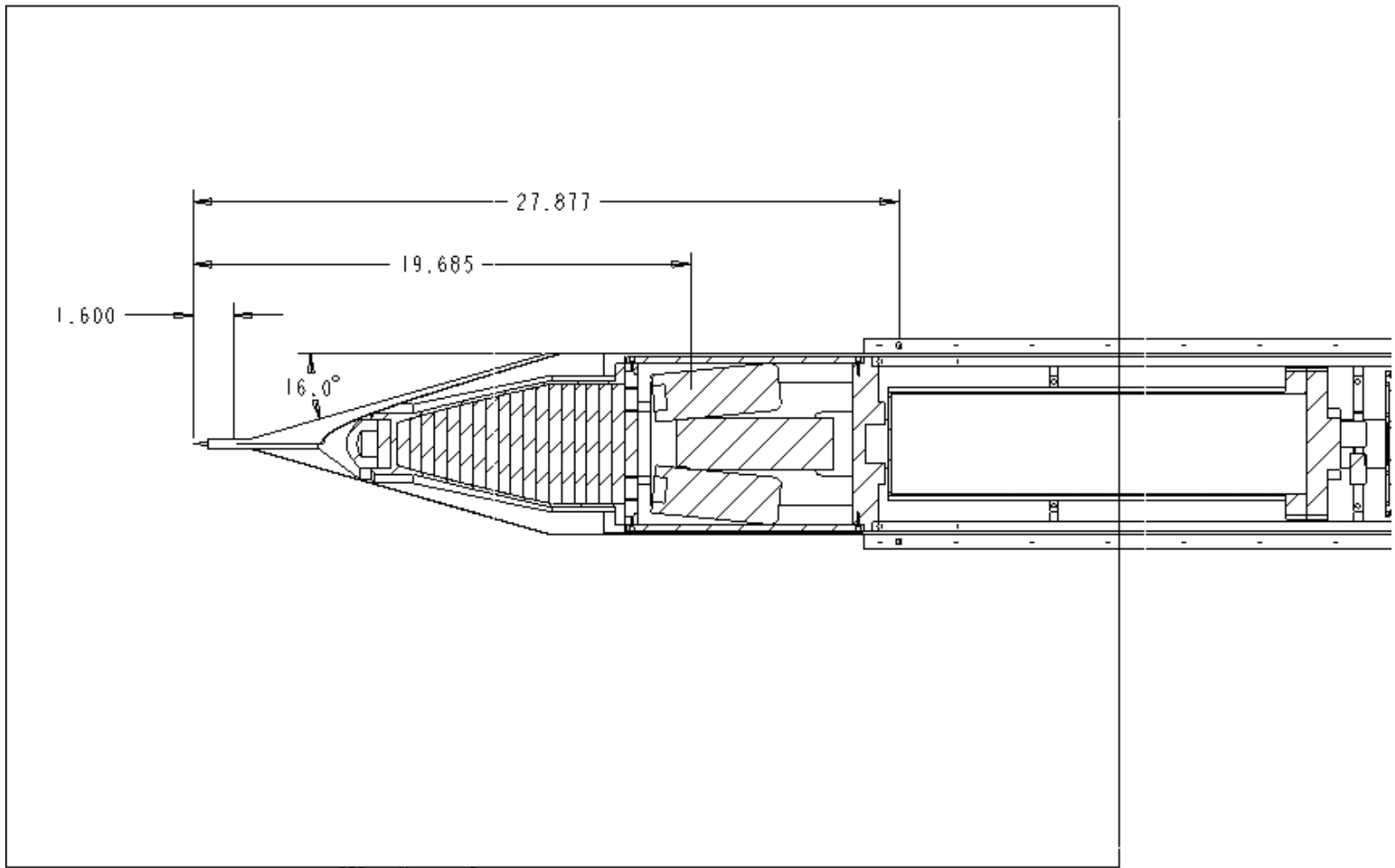

Forward assembly

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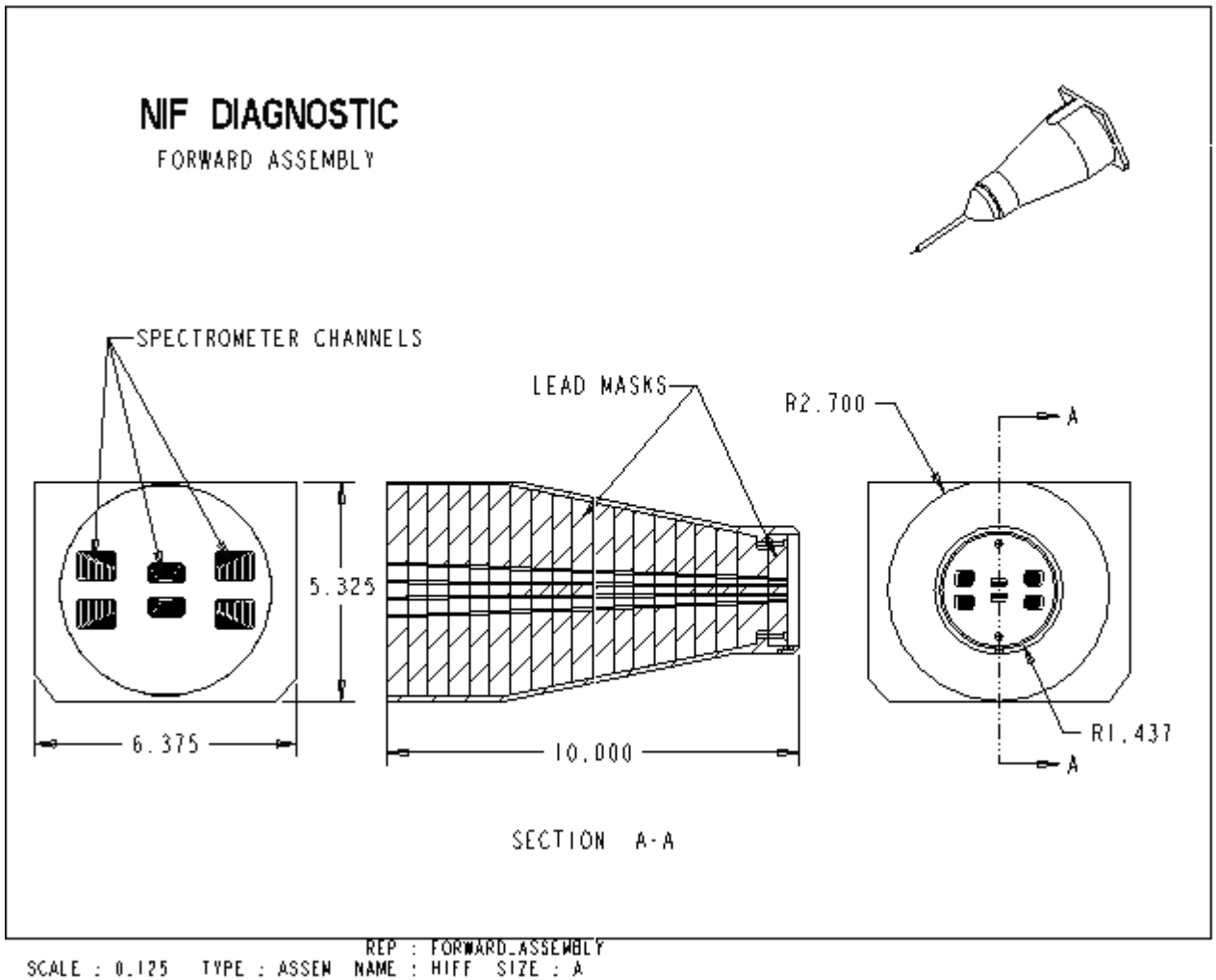

Spectrometer / electronics assembly

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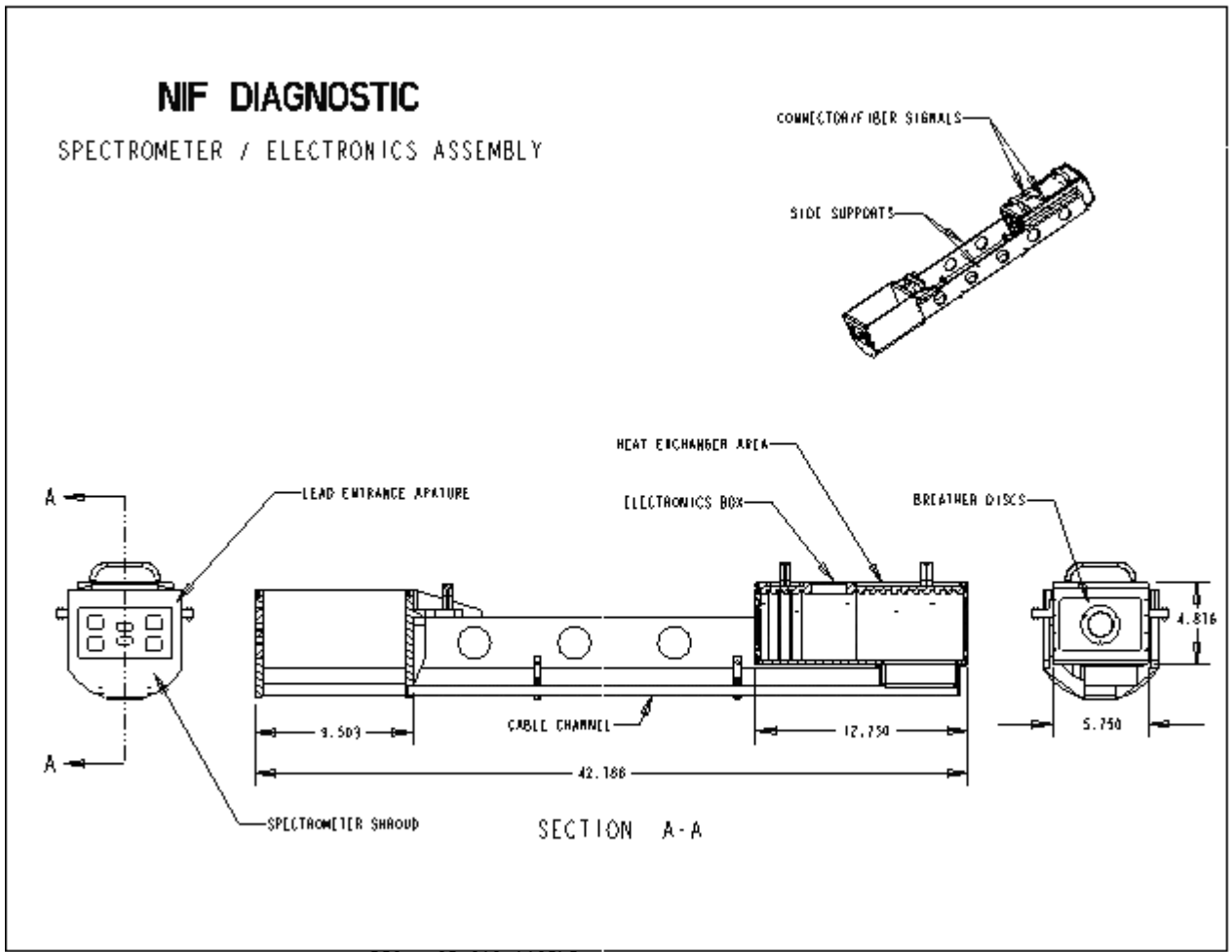

Spectrometer package

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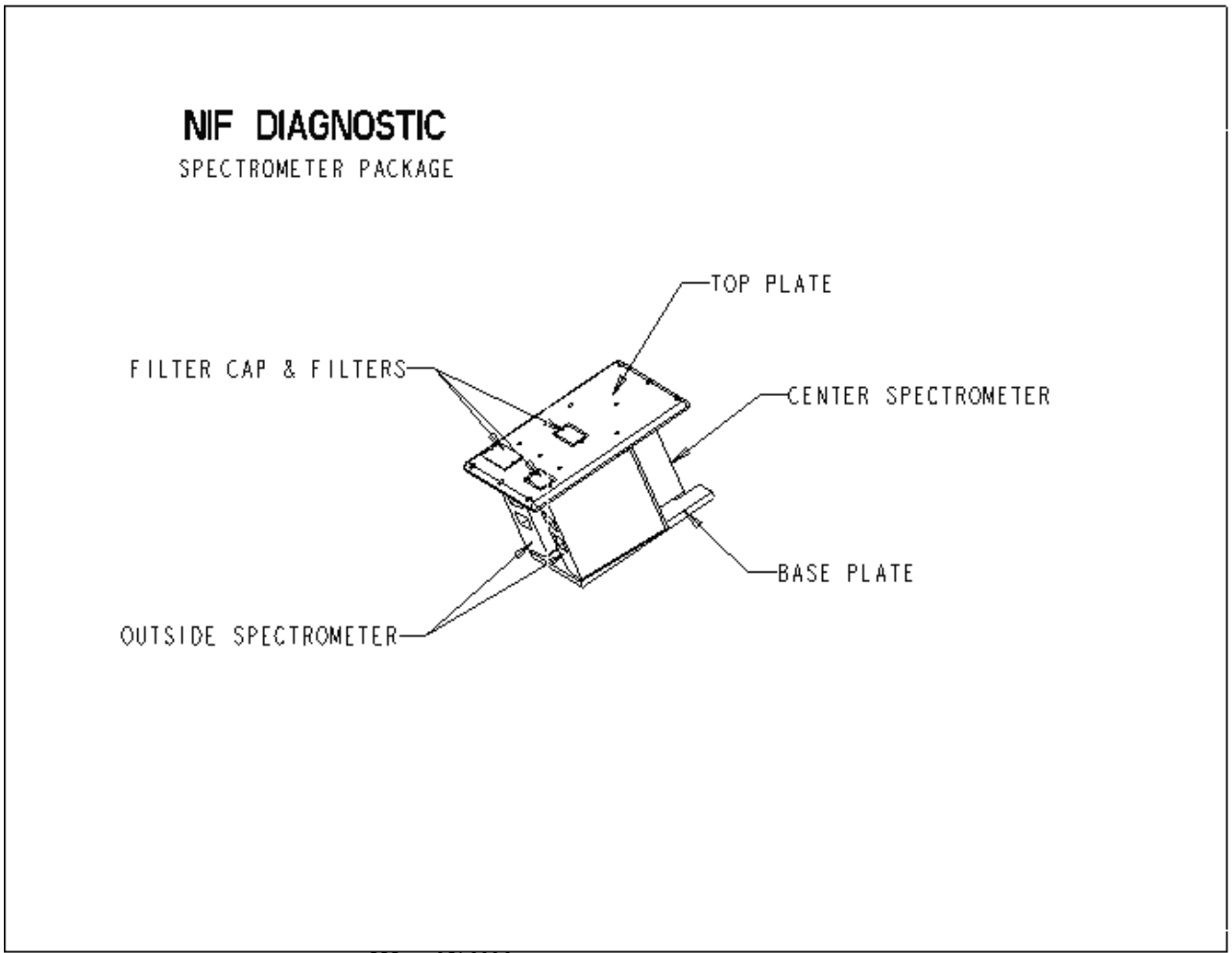

Internal battery pack (IBP)

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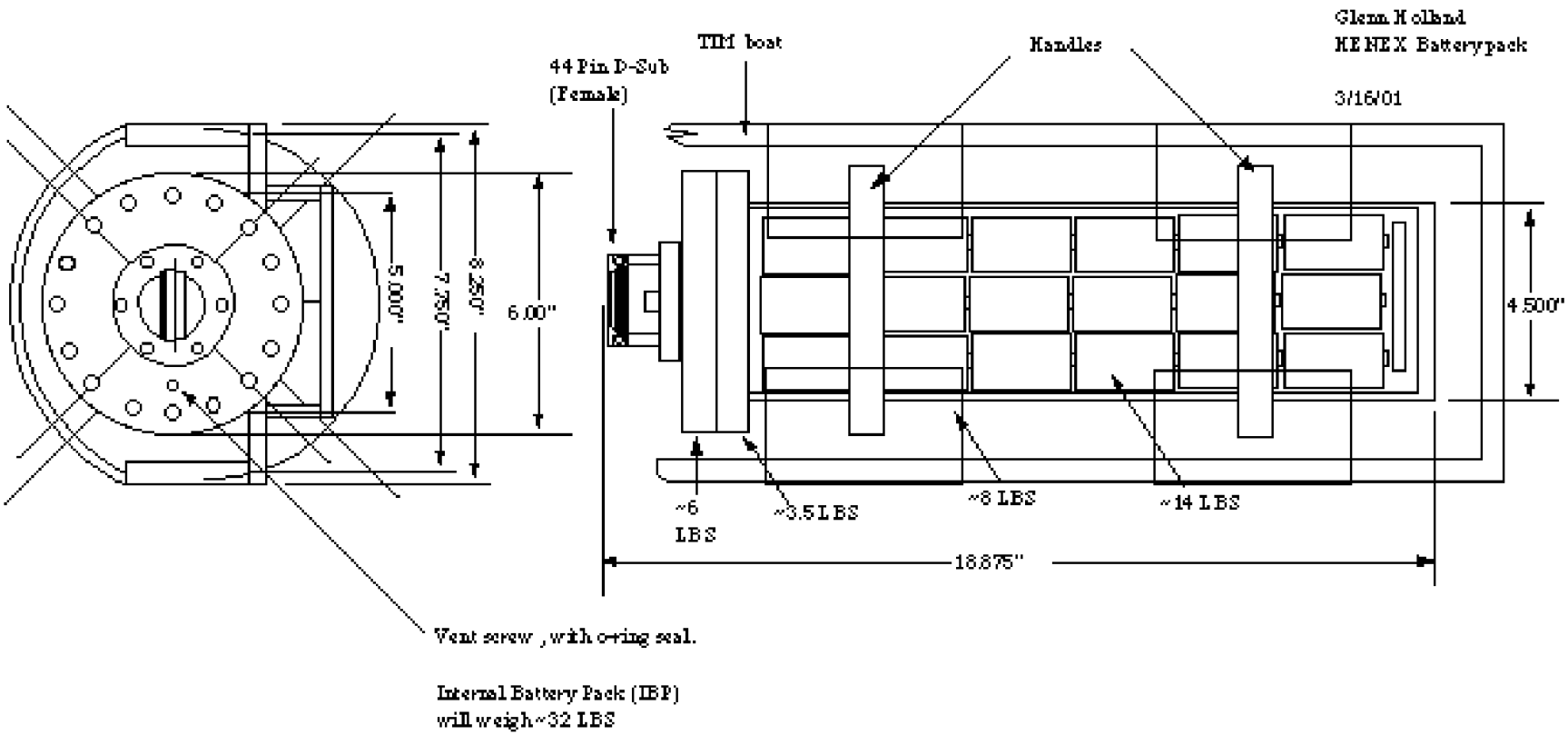

IBP engineering study indicates large safety factors

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The pressure enclosure provides protection from contamination released from the NiCad battery cells during discharge while under vacuum. The safety factor exceeds 4 times normal pressure. The enclosure also provides a tight RF shield to protect the control electronics of the diagnostic from EMI / EMP noise.

Type 304 SS Yield Strength = 30,000 PSI

T=dp/2s t=4.5/2 –4.26/2 =.12 (wall thickness)
D=4.26 (inside diameter)
P=14.7 PSI

.12=(4.26) (14.7)/2s

S=261 PSI = Stress on cylinder, Factor of Safety = 30,000/261 =115

$S=pr^2/t^2 = 14.7\ (4.260/2)^2/(.250)^2 =1067$ PSI

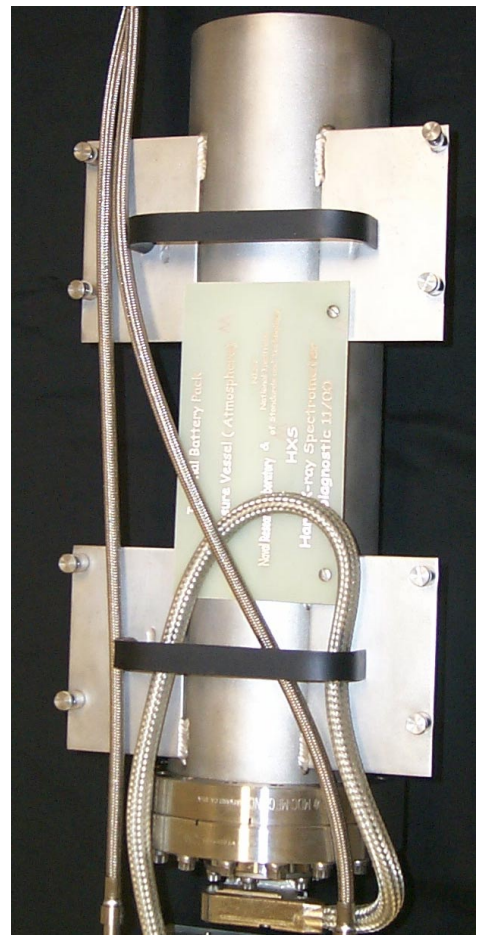
S=1067 PSI = Stress on end cap, Factor of Safety = 30,000/1067 =28

S=P/A A=.12 (4.26 +.12)(3.14)= 1.651 in^2
P=14.7(4.260/2) ^{2} (3.14)=209.5 LBS
S= 209.5/1.651=127 PSI

S=127 PSI = Stress on welds, Factor of Safety = 30,000/127 =236

S=P/A A=.0580 for 5/16-24 Bolts 16 bolts
A= 16(.0580)=.928 in^2
P=14.7(4.260/2) ^{2} (3.14)=209.5 LBS
S= 209.5/.928 =225.8 PSI

S=225.8 PSI = Stress on bolts, Factor of Safety = 30,000/225.8 =133



HENEX Diagnostic Assemblies

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POINTER	FORWARD	SPEC. / ELEC.	BATTERY
POINTER ADAPTER	ENTRANCE APATURE	SPECTROMETERS	BATTERY SUPPORTS
		(NIST)	
PIN	NOSE CONE		PRESSURE VESSEL
		LEAD APATURE	
	PLASTIC SHIELDS		MAIN FLANGE
		SPEC. SHROUD	
	LEAD SHIELD		POWER CONNECTOR
		CROSS BRACE	
		ELEC. BOX	

HENEX Diagnostic Drawing Requirements

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OVERALL ASSEMBLY	1
FORWARD ASSEMBLY	1
POINTER	1
POINTER ADAPTER	1
ENTRANCE CONE	1
LEAD APATURE 1	1
PLASTIC APATURES	9
LEAD APATURE 2	1
SPECTROMETER MODULE (NIST)	NIST
SPECTROMETER/ELEC ASSEMBLY	1
SENSOR SHROUD S. WALLS	1
SENSOR SHROUD F. WALLS	1
SENSOR SHROUD E. WALLS	2
SENSOR SHROUD B. SUPPORTS	1
SENSOR SHROUD B. SKIN	1
SHROUD/ELEC. BRACE & SUPPORTS	2
SHROUD CABLE CHANNEL	1
SHROUD ENTRANCE MASK	1
ELECTRONICS BOX ASSEMBLY	1
ELEC. BOX SIDE WALLS	1
ELEC. BOX END WALLS	1
ELEC. BOX TOP PLATE	1
ELEC. BOX BASE PLATE	1
BREATHER CAP	1
ELEC. BOX / BOAT SUPPORTS	1
ELEC. BOX CONNECTOR COVER	1
HEAT SINKS	4
BATTERY CELL ASSEMBLY	1
BATTERY CELL TANK	1
BATTERY CELL SUPPORTS	1
WELDMENT DRAWING	1
TOTAL	43